

# **ROUTE 29 BRIDGE RESCUE –AFTER ACTION JUNE 20, 2012**



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**PREPARED BY:**

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MFF CHASE FABRIZIO- ROPE TSO**

## ROUTE 29 BRIDGE RESCUE

### SUMMARY

On June 20, 2012 at 1120 hours, units were dispatched for a reported below-grade rescue at the Route 29 Bridge near the intersection of Columbia Pike and Stewart Lane in FS15's area.

C742E arrived on the scene and reported that an individual had fallen 80' from the Route 29 Bridge to the rocky ground below. Crews from M715 and T715 quickly accessed the patient via a steep rocky trail, assessed his condition, and began to provide vital ALS care.

BC701, arriving at the same time as C742E, established command on the Bridge and worked as the Recon Group Supervisor. T716's Officer was assigned as the Extrication Group Supervisor. The Recon Group Supervisor and Extrication Group Supervisor developed a plan to hoist the patient back onto the road surface via a rope system.

On-duty assets worked alongside an off-duty technical rescue asset in sweltering heat to implement the planned rescue. This successful extrication and rescue plan was devised, implemented, and completed in less than 30 minutes from the time of arrival. Upon lifting the patient to the roadside, the patient was safely transferred to Trooper 3 for immediate helicopter transport to Baltimore Shock Trauma.

#### BC701

B/C C. Bailey

#### RS715

FF3 M. Ryman

#### T715

MFF M. Butler

MFF J. Smith

MFF J. Hoover

FF2 J. Ilowite

#### Off-Duty

MFF C. Fabrizio

#### C742E

A/C M. Dempsey

#### RS742

Capt. J. Stutz

FF3 W. Hancock

FF3 O. Cruz-Nelson

#### M715

FF3 P. Paradise

FF3 C. Dietz

#### E725

MFF J. Smith

FF3 J. Trawinski

FF3 J. Eberly

FF3 R. Travers

FF2 S. Murphy

#### T716

Lt. P. Gross

MFF D. Carter

FF3 L. Wright

## INCIDENT REVIEW

After clearing initial confusion about the actual location of the event initial arriving units worked to make access to the patient via a steep “goat” trail that lead to the bottom of the ravine where the patient was. After making access to the patient units, including an experienced Chief Officer, began to stabilize the patient and develop and extrication strategy.

Command initially started with a parallel strategy, that is while the personnel with patient proceed with emergency care and packaging, intending to walk the patient out, command also began to build out the resources necessary to complete a high angle rescue using AT715 and standard rope rescue techniques.

At least initially both those plans were put into play and command remained undecided about what the best course of action would be. The Chief on the ground recommended on multiple occasions that the patient be carried out. However, command had reservations about this approach.

Command broke the incident down into a “recon group” led by Chief 742 Echo and which included all the units at the patient’s side and an “extrication group” which included all the remaining personnel with the Lt. of T716. The ISSO was the officer of RS742-B.

The primary concern at this point was whether or not there were sufficient resources, both in technical expertise and manpower to safely hoist the patient out of the ravine a distance of about 100’. The arrival of additional rope specialists from SPECOPS725 on Engine 725 added in the decision making process bringing an additional level of rope expertise and redundancy.

Consideration of the decision to hoist over the decision to walk the patient out is necessarily an exercise in retrospective judgments and relied more on engrained heuristics than any formal logic processes. At the time the extrication group reported that based on the terrain they would need to set up multiple slope evacuation systems. That tactic would take time, would require multiple systems, would distribute the workforce over a larger geographical area and would, in my opinion have introduced additional failure points. The decision to lift as opposed to carry was based on this thought process.

However, the fundamental failure of the above thought process was that it did not adequately consider any possible impact to the patient. It is safe to assume that an adult male who fell almost 100’ is at a high risk for spinal cord injury. Those injuries are notoriously unstable and it is always possible that a sublimation or other spinal cord injury is exacerbated by additional movements, such as rescuer

tripping on a steep uphill carry. This is not to imply that anything but that extreme fall was the proximate cause of injury but our charge is to do no additional harm.

In retrospect the hoist was the better idea for multiple reasons:

1. It consolidated expertise
2. It only required one rope system, not two
3. It made for easier command and control

The real best reason, that was unexplored that day, was that the hoist limited to the extent possible any additional movement of or shock to the patient's spinal column. This fact along with the fact that the time to execution difference of both operations was negligible made the hoist the best option.

In the end the measure of success is multi-faceted. It is true that we did no additional harm, that the plan worked and that no one was injured, however, this analysis asks the questions, "...did we do the right thing and did we do the best thing, did we do them safely and did we do them for the right reasons?" I am certain that we did the right thing safely, I am not so certain that we did them for the right reasons. The patient must always come first and admittedly his needs did not factor into the decision making process.

Further, I commend the unit officers, including the Chief who over and over suggested carrying the patient out. It is critical in an operation of this nature, a low frequency, high-risk event, that everyone feel empowered to raise objections and concerns. There were two lives hanging on the end of a rope for over 100' and that is not a decision to be made lightly or without input from all the stakeholders.

There were subordinate considerations as well:

- It was hot, there was no shade- command should have called for available rehab resources
- Command should have considered calling for additional personnel, it worked but there were no reserve players at any point in the evolution.

In conclusion I consider that despite the noted failings this was an excellent evolution and all personnel performed well. With respect to the technical aspects of the rope systems used and the problems/successes encountered with them I leave that discussion to the technical expert in the following section.

## TECHNICAL CONSIDERATIONS

The off duty Rope Technician checked in with command upon arriving on scene and was instructed to work with the officer of T716, who was the Extrication Group Leader. After initially sizing up the incident and receiving an update from the Extrication Group Leader, the off duty technician assumed the Extrication Group.

The rope system that crews were constructing to raise the patient was evaluated and assessed for efficiency and versatility. It was determined that the initial system was not going to be the most efficient for the 100' raise due to the anticipated multiple resets of the mechanical advantage system, spacing between anchors, and lengths of rope available. A new rope system was engineered that used some of the anchors already placed and constructed to assist with saving time.

Crews rigged the ladder of AT715, two two-point fixed focus anchors with change of directions which the main and belay lines passed through, to allow it to be used as an artificial high directional (AHD).

This AHD not only afforded rescuers the ability to raise the patient and attendant without them coming in contact with the bridge supports or road deck overhang but also provided an effortless transition from the rope system to the roadway.

The ropes (Main and Belay) were routed down and inline with the bottom side of the ladder to assure there were no lateral forces placed on the aerial.

The belay line was anchored to the officer's side front tandem wheel with a wrap three pull two constructed of one inch tubular webbing. The belay system was constructed using tandem triple wrap prusiks. The main line passed through a change of direction from the officer's side rear tandem wheel with a ratcheting prusik and continued outwards perpendicular from the truck to another change of direction that was attached to the tow hook of one of the command vehicles where the rope terminated.

The main line was routed in this fashion to assure that when forces were applied to the rope, those forces would not cause a lateral force to be applied to the aerial ladder but actually create a compression force where the aerial is its strongest, in turn creating a safer system.

Due to the elevation of the aerial, the distance of the victim below grade, and having to route the main line through several change of directions, the three hundred foot rope was not long enough to use in single rope system. A second rope was used to create a 3:1 mechanical advantage (MA) system that was

anchored to one of the outriggers of T716 with a wrap three pull two constructed of one inch webbing.

The mechanical advantage system was expanded out to its full length and ganged onto the first rope of the main line system using a triple wrap prusik. It was decided to utilize a 3:1 as opposed to a larger system because of the number of rescue personnel on scene to assist with hauling.

Using a larger mechanical advantage would have required more rope to be moved through the system creating a delay in the patient's transport from below. It was also decided that when the attendant and victim are raised above the road deck to clear the jersey walls, the rescuers would lower them to the ground by expanding the MA system instead of placing a decent control device in the system. The process of changing from a raise to a lower and adding equipment would of required trained personnel that were proficient in doing so, which were not on scene.

The main and belay line passed through the AHD and traveled to the ground where they terminated with a double long tail bowline. The stokes basket was secure to the double long tail bowline by the stokes bridle from T716. A member from Company 25 was attached to the system as well to serve as a patient attendant. To assist with controlling the stokes basket during its raise and short lower, two tag lines were attached to the stokes basket on opposing sides. One tag line was maintained from the bridge above while the crews below maintained the other.

Once the rope system was constructed, all personnel of the extrication group were gathered together for a briefing. The Extrication Group Leader explained the process and the commands that would be given to the group during the raise and lower evolutions and then assigned personnel specific tasks within group (main line leader, belay line, edge, etc). The safety officer, Extrication Group Leader, and one other member form the group completed a safety check of the system utilizing the "three sets of eyes" rule. A ready was received from the attendant and crews began the raise.

The victim and attendant were raised to the point where they would cleared the jersey walls and deflecting them to the road surface with the tag lines could be accomplished. Rescuers collapsed the MA system and began to lower with the system. The ratchet prusik that was put in place to allow the resetting of the mainline grabbed the rope and prevented the victim to be lowered. A 4:1 micro system was used to pull the weight of the victim and the attendant off of the prusik so it could be released from the line. The victim was lowered to the ground and once disconnected from the system an all stop was called.

### Operational Notes

While the initial crews on scene performed basic skills well, the initial system that was engineered would not have allowed the patient to be removed in the most timely or efficient manner.

The initial system is what we require our truck and tower drivers to complete during their certification process. While this system works for removing someone when a short raise is required it does not work well for long raises with personnel that are only trained to a basic level due to the techniques required to reset or adjust the system. Personnel should recognize and understand the limitations of their systems that they have been trained to use.

When the off duty technician arrived on scene and assessed the system that was being constructed, it appeared that there were a couple different ideas and plans working at the same time. This created a level of confusion not only when trying to assess and understand what was being done but also created a bit of confusion among the rescuers. It is imperative with technical rescue incidents there is a clear and single plan for operators to follow to improve efficiency and safety.

During the construction and operation of the system, including during raising, and lowering there was equipment and/or rope that was not organized well. At one point, the lack of organization with the main line haul rope created an issue with trying to reset the system. A couple of minutes were wasted while the mess was organized allowing the system to be reset. It is imperative to maintain organization and order to all ropes and equipment to facilitate safe and efficient systems.

The crews performed basic skills well but a considerable amount of time was lost with either correcting issues or relaying specific instructions to personnel who were not trained as rope technicians. Additional personnel from Companies 29 and 31 would have provided additional rope technicians on scene to assist with completing specific tasks and correcting issues. This would have decreased the time that was required to remove the victim from below.

It is evident that the crews were able to construct a system with direction but it is unclear if the crews would be able to adjust and correct issues that may arise during the operation.

All personnel performed the basic skills well. This allowed the system to be constructed and operated in a timely fashion.

All personnel communicated well. If there were questions or concerns with what needed to be done personnel spoke up. When operations began, personnel followed directions and commands closely. This allowed for a safe and efficient operation.

### **Additional Notes**

Complicating the special operations response was the fact that station alerting did not activate for FS29 and FS31 even though RCN731 and SU729 where identified deficiencies in CAD. When those stations queried ECC they were told that they where not due. They should have been added to the event.

Questions about which units should or should not have responded, especially as it relates to special operations events should be directed to the responding Battalion Chief or Special Operations Chief for final disposition.

It is recommended that all rope evolutions, no matter the extent or anticipated complexity of the evolution should involve the rostered Rope TSO (*as defined by the daily TRT line-up*) be dispatched.

The assumption that any certified truck drivers is capable of setting up and performing a “stokes evolution” or slop evacuation is not accurate. Further, it is critical to have multiple sets of well-trained “eyes” to evaluate any rope system on which a living human is being rescued on or with.



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